



DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

ENTERED



JUN 05 2017



Colonel Dawn A. Nickell
377 ABW/CV
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5000

Mr. John Kieling, Bureau Chief
Hazardous Waste Bureau (HWB)
New Mexico Environment Department (NMED)
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

Dear Mr. Kieling

Attached please find attached the *Work Plan for Extraction Well KAFB-106157 Abandonment and Reporting* associated with the Bulk Fuels Facility Spill interim measure at Solid Waste Management Unit ST-106/SS-111, Kirtland Air Force Base, New Mexico. The Work Plan has been prepared to comply with *Part 6.5.17.10.9 (Well or Piezometer Abandonment)* of the Hazardous Waste Treatment Facility Operating Permit (HWTFF Permit No. NM9570024423 --"RCRA Permit"). In addition, a Plugging and Abandonment Plan has been approved by NMOSE in accordance with New Mexico Administrative Code 19.27.4.

If you have any questions or concerns, please contact Mr. Scott Clark at (505) 846-9017 or at scott.clark@us.af.mil or Dr. Adria Bodour at (210) 241-6276 or at adria.bodour.1@us.af.mil.

Sincerely

DAWN A. NICKELL, Colonel, USAF
Vice Commander

Attachment:

Work Plan for Extraction Well KAFB-106157 Abandonment and Reporting 2 Hard Copies/2 CDs
cc:

- NMED (Borrego) letter
- NMED GWQB (Agnew, Hunter), letter and CD
- EPA Region 6 (King, Ellinger), letter and CD
- SAF-IEE (Lynnes), electronic only
- AFCEC/CZ (Bodour, Clark, O'Grady), electronic only
- USACE-ABQ District Office (Simpler, Phaneuf, Dreeland, Sanchez, Salazar), electronic only
- Public Info Repository, Administrative Record/Information Repository (AR/IR) and File

KAFB4531

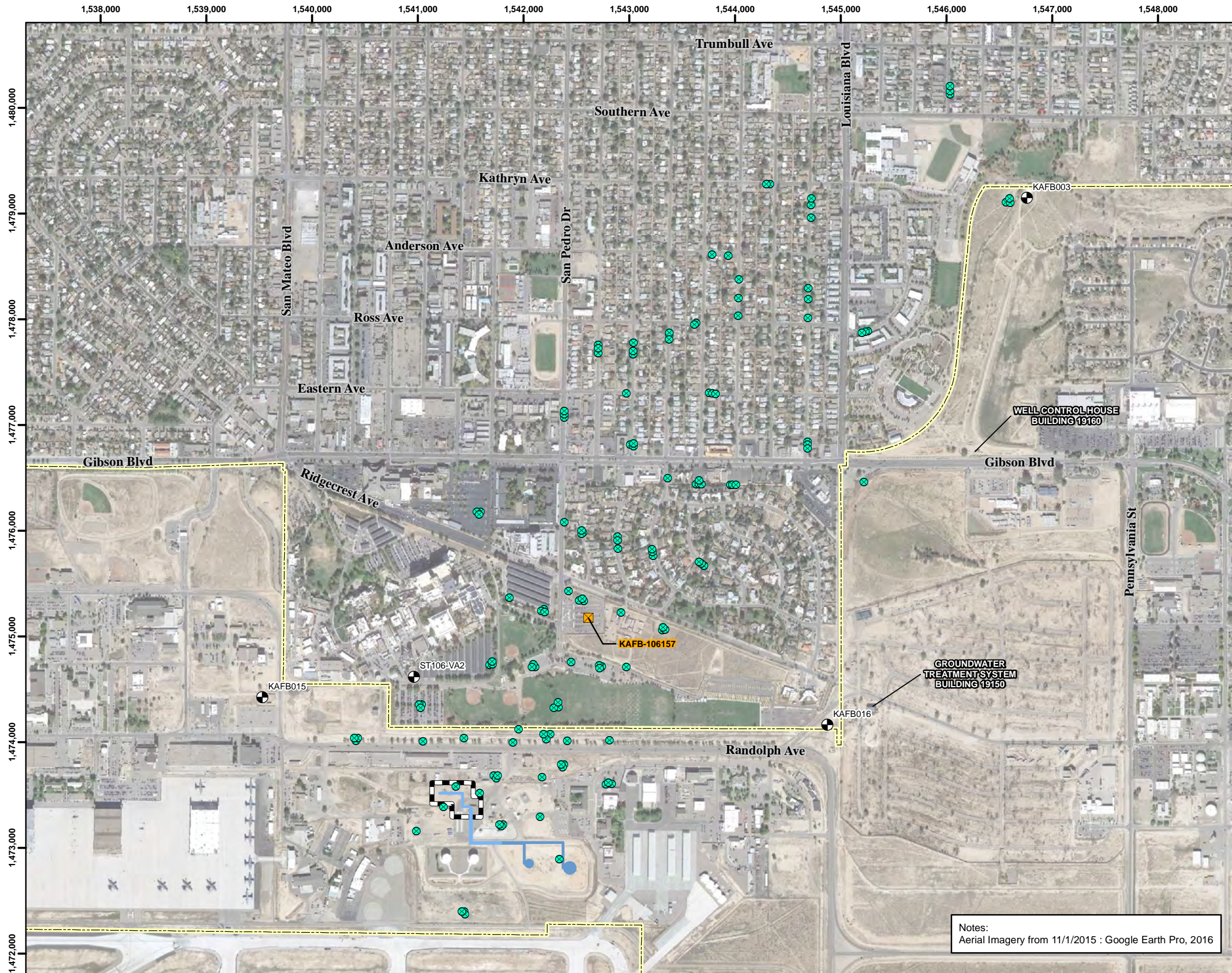


Work Plan for Extraction Well KAFB-106157 Abandonment and Reporting

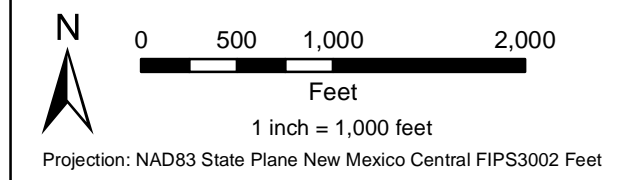
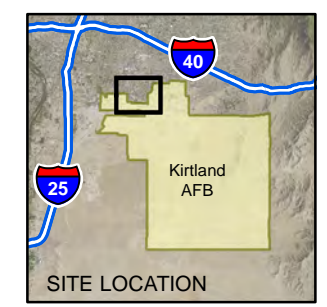
Groundwater extraction well KAFB-106157 will be abandoned in place as proposed with this letter work plan and in accordance with New Mexico Office of the State Engineer (NMOSE) regulations. Extraction well KAFB-106157 is located north of the Kirtland Air Force Base (AFB) (Figure 1) and is constructed with an 8-inch diameter screen and casing. KAFB-106157 was installed via an air rotary casing hammer drilling rig on December 16, 2011 to a depth of 545 feet below ground surface (bgs) in a 13-5/8-inch borehole to 220 feet bgs, and an 11-3/4-inch borehole from 220 to 545 feet bgs. The well construction diagram is provided in Figure 2. A Plugging and Abandonment Plan has been approved by NMOSE in accordance with New Mexico Administrative Code 19.27.4 (Attachment 1).

The entire well will be pressure-grouted from the bottom upwards to land surface using a tremie pipe. The well will be plugged with neat cement slurry with 5% bentonite. Specific technical plugging conditions approved by the NMOSE are provided in Attachment 1. All surface completion elements, including concrete pad, bollards, and caps, will be disposed of as construction debris at Kirtland AFB Construction and Demolition Landfill.

A plugging record will be maintained by the driller as work progresses. The licensed driller will file a complete plugging record with NMOSE and the permit holder (Kirtland AFB) no later than 20 days after completion of the plugging. The plugging record will be on an NMOSE-prescribed form and will include the name and address of the well owner, the well driller's name and license number, the name of each drill rig supervisor that supervised the well plugging, the location of the borehole (reported in latitude and longitude using a Global Positioning System receiver capable of 5-meter accuracy), the date when plugging began, the date when plugging concluded, the plugging material(s) used, and the depth of the borehole. The plugging record will also include a completed borehole log including detailed information on the depth and thickness of all strata plugged, noting whether each stratum was water bearing. The report will be submitted to NMOSE, following review and acceptance by United States Army Corps of Engineers and Air Force Civil Engineer Center. The abandonment reports filed with NMOSE will be included in the corresponding Quarterly Monitoring Report.



- Legend**
- ☒ Extraction Well Proposed for Abandonment
 - ⊕ Drinking Water Supply Well
 - Groundwater Monitoring Well
 - Former Aboveground Storage Tank
 - Former Buried Fuel Transfer Line
 - Former Aboveground Fuel Transfer Line
 - - - Installation Boundary
 - ▭ Source Area



LETTER WORK PLAN FOR
 KAFB-106157 ABANDONMENT
 BULK FUELS FACILITY
 SOLID WASTE MANAGEMENT UNIT ST-106/SS-111
 KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

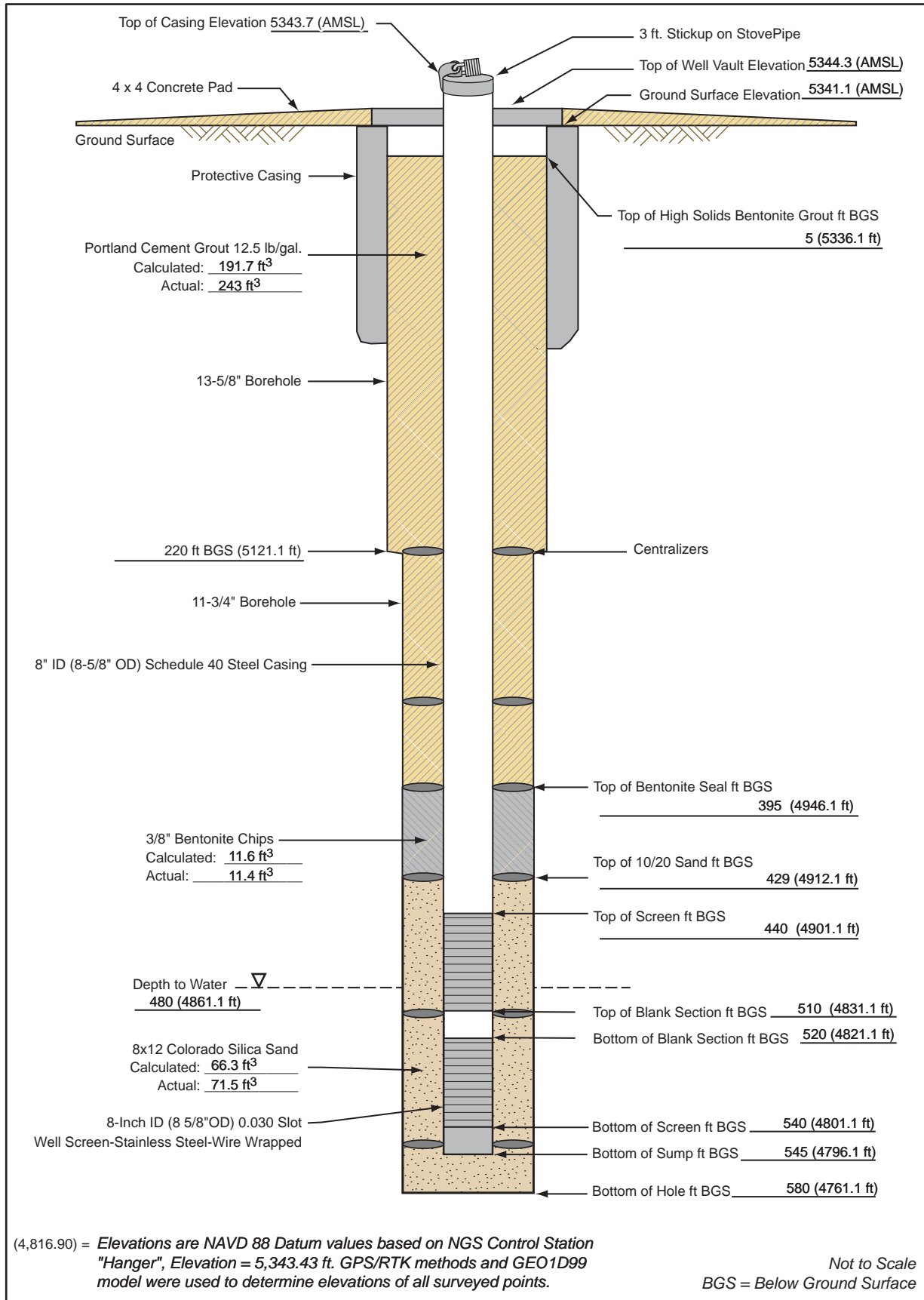
KAFB-106157 EXTRACTION WELL LOCATION

Notes:
 Aerial Imagery from 11/1/2015 : Google Earth Pro, 2016

Figure 2. Extraction Well KAFB-106157 Construction Diagram

Installation Start Date/Time: 12/10/11 @ 0800

Installation End Date/Time: 12/16/11 @ 0900



ATTACHMENT 1

**New Mexico Office of the State Engineer
Approved Well Plugging Plan
RG-1579 POD 218
KAFB-106157**



DISTRICT I

TOM BLAINE, P.E.
STATE ENGINEER

5550 San Antonio NE
Albuquerque, NM 87109
(505) 383-4000

November 10, 2016

FILE: RG-1579 POD 218

John Pike
AFCEC/Kirtland AFB 1st
2050 Wyoming Blvd., SE
Kirtland AFB, NM 87117

Greetings:

Enclosed is the Well Plugging Plan of Operations which has been approved subject to the Conditions of Approval, attached hereto.

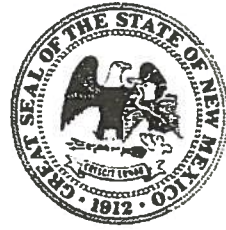
Sincerely,


Gary Stansifer
Water Resource Specialist Senior

Enclosures as stated



WELL PLUGGING PLAN OF OPERATIONS



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: RG-1579 POD 218 (KAFB-106157)

Name of well owner: Kirtland Air Force Base

Mailing address: AFCEC/Kirtland AFB IST; Bldg 20685; 2050 Wyoming Blvd SE

City: Albuquerque State: New Mexico Zip code: 87117-5270

Phone number: 505-853-3484 E-mail: ludie.bitner@us.af.mil

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: National EWP, Inc.

New Mexico Well Driller License No.: WD-1210 Expiration Date: Unknown

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan. On file at OSE District I

1) GPS Well Location: Latitude: 35 deg, 3 min, 15.00 sec
Longitude: 106 deg, 34 min, 36.00 sec, NAD 83
Northing: 1475168.4 Easting: 1542616.1

2) Reason(s) for plugging well: Well does not meet the objectives of the groundwater remediation effort.

3) Was well used for any type of monitoring program or environmental assessment? Yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? Yes If yes, provide additional detail, including analytical results and/or laboratory report(s): Well completed in the uppermost aquifer containing dissolved phase volatile organic compounds associated with the Kirtland AFB Bulk Fuels Facility release. Analytical laboratory results are provided in Attachment I.

5) Static water level: ~465 ft below ground surface (bgs)

6) Depth of the well: 545 ft

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ALBUQUERQUE, NEW MEXICO
2016 NOV -3 PM 4:00

Trn. No

- 7) Inside diameter of innermost casing: 8 inches.
- 8) Casing material: Schedule 40 Steel Casing
- 9) The well was constructed with:
 _____ an open-hole production interval, state the open interval: _____
 a well screen or perforated pipe, state the screened interval(s): 440-510 ft bgs; 520-540 ft bgs
5-395 ft bgs cement grout;
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? 395-429 ft bgs bentonite
- 11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? _____ If yes, please describe: _____
- 12) Has all pumping equipment and associated piping been removed from the well? Yes If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal.

- 1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well: Well Casing will be pressure-grouted from total depth to surface, upper two-feet of casing will be removed, surface completion will be removed, surface will be back-filled and leveled.
- 2) Will well head be cut-off below land surface after plugging? Yes

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface: 7 cubic yards
- 4) Type of Cement proposed: Portland Cement (Type II)
- 5) Proposed cement grout mix: 6 gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: batch-mixed and delivered to the site
 _____ mixed on site

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7) Grout additives requested, and percent by dry weight relative to cement: 5-percent bentonite

8) Additional notes and calculations: None

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

Upon completion, RG-1579 POD 218 (KAFB-106157) did not meet performance objectives for inclusion in the Kirtland AFB groundwater remediation system.

VIII. SIGNATURE:

I, ERIC H. FROEHLICH, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.



Signature of Applicant

COLONEL, USAF, 377 ABW COMMANDER

4 Nov 16

Date

STATE ENGINEERS OFFICE
ALBUQUERQUE, NEW MEXICO
NOV - 3 PM 4: 30

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

- Approved subject to the attached conditions.
- Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 9th day of NOVEMBER, 2016

Tom Blaine P.E., New Mexico State Engineer

By: Gary Stansifer

Trn. No

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Ground surface
Bottom of proposed interval of grout placement (ft bgl)			545
Theoretical volume of grout required per interval (gallons)			1,423
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			batch-mixed and delivered
Grout additive 1 requested			bentonite
Additive 1 percent by dry weight relative to cement			5
Grout additive 2 requested			None
Additive 2 percent by dry weight relative to cement			None

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Trn. No

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest		Interval 2		Interval 3 – most shallow
					Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)					
Bottom of proposed sealant or grout placement (ft bgl)					
Theoretical volume of sealant required per interval (gallons)					
Proposed abandonment sealant (manufacturer and trade name)					

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DISTRICT 1
SCOTT A. VERHINES, P.E.
NEW MEXICO STATE ENGINEER

Materials submitted by Kirtland Air Force Base identify well RG-1579 POD 218 (8"-diameter, 545' deep), located at Kirtland Air Force Base, Bernalillo County, as scheduled for plugging. National EWP, Inc. (WD-1210) will perform the plugging.

Permittee: Kirtland Air Force Base, RG-1579 POD 218

Location: Kirtland Air Force Base, Bernalillo County, NM

Approximate well coordinates: Latitude: 35° 3' 15.00" N, Longitude: 106° 34' 36.00" W

Specific Plugging Conditions of Approval for RG-1579 POD 218, Bernalillo County

1. Water well drilling and well drilling activities, including well plugging, are regulated under 19.27.4 NMAC, which requires any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the New Mexico Office of the State Engineer (NMOSE). Therefore, the firm of a New Mexico licensed Well Driller shall perform the well plugging.
2. Theoretical volume of sealant required for abandonment of the 8"-casing is approximately 2.777 gallons per foot. Total minimum volume of necessary sealant shall be calculated upon sounding the actual pluggable depth of the well.
3. The Well Plugging Plan of Operation submitted indicates a neat cement grout will be used for the plugging. Fundamental water demand for Type I/II Portland neat cement grout is 5.2 gallons per 94 lb/sack cement. Use of mix water increment in excess of this amount results in a thinned mix of cement prone to shrinkage that may disrupt effective sealing and hydraulic separation. AWWA Well Standards allow use of a maximum of 6.0 gallons water per 94 lb/sack cement if necessary for pumpability of neat cement grout.
4. Placement of the grout slurry within the well shall be by pumping through a tremie pipe extended to near well bottom and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column upwards from below (note Condition 6, below). Tremie pipe may be pulled as necessary to retain minimal submergence in the advancing column of sealant.

5. Any open annulus encountered surrounding the 8” casing shall also be sealed by the placement of the approved cement grout mix. Prior to, or upon completion of plugging, the well casing may be cut-off below grade as necessary to allow approved redevelopment or grading onsite, provided a minimum 6-inch thickness of reinforced abandonment grout or concrete completely covers the top of the cut-off casing. More stringent local building codes may apply.
6. Should the NMED, or another regulatory agency sharing jurisdiction of the project authorize, or by regulation require a more stringent well plugging procedure than herein acknowledged, the more-stringent procedure should be followed. This, in part, includes provisions regarding pre-authorization to proceed, contaminant remediation, inspection, pulling/perforating of casing, or prohibition of free discharge of any fluid from the borehole during or related to the plugging process.
7. NMOSE witnessing of the plugging will not be required, but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal work hours by calling the District 1 NMOSE Office at 505-383-4000, at least 48-hours in advance. NMOSE inspection will occur dependant on personnel availability.
8. A NMOSE Plugging Record (available at: <http://www.ose.state.nm.us/PDF/WellDrillers/WD-11.pdf>) itemizing actual abandonment process and materials used shall be filed with the State Engineer (NMOSE, 5550 San Antonio Drive NE, Albuquerque, NM 87109-4127), within 20 days after completion of each well plugging. Please attach a copy of these plugging conditions.

The NMOSE Well Plugging Plan of Operations is hereby approved with the aforesaid conditions applied.

Witness my hand and seal this 9th day of November, 2016.

Tom Blaine, P.E. State Engineer

By: 

Gary Stansifer
Water Resource Specialist